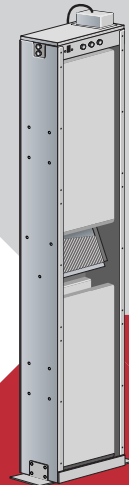


DC600 Portal

Integrator Guide



DC600 Portal Integrator Guide

72E-71772-02

Revision A

August 2005

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Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev A	June. 2005	Initial Release
-02 Rev A	August 2005	Chapter 1 Added: Facility Power Requirements. Chapter 2 Installation procedures, sequence was updated.

Contents

Revision History	iii
------------------------	-----

About This Guide

Introduction	ix
Chapter Descriptions	ix
Notational Conventions	ix
Related Documents and Software	ix
Service Information	x
Symbol Support Center	x

Chapter 1. Getting Started

Introduction	1-3
Facility Power Requirements	1-3
DC600 LEDs	1-4
DC600 Standard Edition	1-4
DC600 Professional Edition	1-4
Motion Sensor	1-4
DC600 Configurations	1-4

Chapter 2. *Installation*

Introduction.....	2-3
Installation Configurations.....	2-3
Two Single DC600s.....	2-3
One Dual with Two Singles.....	2-4
Multiple Duals with Two Singles.....	2-4
Two Slim Singles.....	2-5
Mounting the DC600 to the Floor.....	2-6
Installing the Floor Guard (Optional).....	2-6
Installing Power and Ethernet Cables.....	2-7
Powering the XR400.....	2-8

Chapter 3. *Motion Sensor Configuration*

Introduction.....	3-3
Antenna Setup and Configuration for Polling with Motion Sensor.....	3-3
Single Model With Two Antennas.....	3-3
Dual Model.....	3-4

Appendix A. *Specifications*

Technical Specifications.....	A-3
DC600 Specifications.....	A-3
Base Plate Mounting Dimensions - Single/Dual Model.....	A-4
Base Plate and Floor Guard Mounting Dimensions - Single/Dual Model.....	A-5
Base Plate Mounting Dimensions - Slim Single Model.....	A-5
Base Plate and Floor Guard Mounting Dimensions - Slim Single Model.....	A-6
Sensor and Light PCB Signals and Pinouts.....	A-7
GPIO Signals.....	A-9
LED PCB Wiring Diagram.....	A-10

Appendix B. *XML Software Commands*

Reader Status LED Commands.....	B-3
Example 1.....	B-3
Example 2.....	B-3

Index**Tell Us What You Think...**

About This Guide

Introduction	ix
Chapter Descriptions	ix
Notational Conventions	ix
Related Documents and Software	ix
Service Information	x
Symbol Support Center	x

Introduction

This *Integrator Guide* provides information about installing and using the DC600 portal system, a fully assembled turn-key solution that uses Radio Frequency Identification (RFID) for asset identification and tracking goods movement.

Chapter Descriptions

Topics covered in this guide are as follows:

- *Chapter 1, Getting Started* provides an overview of the DC600 portal system.
- *Chapter 2, Installation* describes how to install the DC600 hardware and components.
- *Chapter 3, Motion Sensor Configuration* describes how to configure the XR400 to work with the DC600 when using a motion sensor, and how to install the antennas and group them logically using firmware to avoid deployment problems.
- *Appendix A, Specifications* provides technical specifications for the DC600 and motion sensor, signals, and pinouts.
- *Appendix B, XML Software Commands* lists the XML commands for controlling LEDs.

Notational Conventions

The following conventions are used in this document:

- *Italics* are used to highlight the following:
 - chapters and sections in this and related documents
 - dialog box, window and screen names
 - drop-down list and list box names
 - check box and radio button names
 - icons on a screen.
- **Bold** text is used to highlight the following:
 - key names on a keypad
 - button names on a screen.
- Bullets (•) indicate:
 - action items
 - lists of alternatives
 - lists of required steps that are not necessarily sequential.
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Documents and Software

The following documents provide more information about the DC600 Portal system.

- *DC600 Portal Quick Reference Guide*, p/n 72-71771-xx
- *XR400 RFID Reader Integrator Guide*, p/n 72E-71773-xx
- *XR400 Interface Control Guide*, p/n 72E-71803-xx
- *XR400 Reader C API Programmer Reference Guide*, p/n 72E-73028-xx
- *TagVis User Guide*, p/n 72E-71804-xx
- *ReaderComm5DLL Developer Guide*, p/n 72E-71805-xx
- DC600 Floor Guard QRG, P/N 72-75043-xx.

For the latest version of this guide and all guides, go to: <http://www.symbol.com/manuals>.

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If the problem cannot be solved over the phone, the equipment may need to be returned for servicing. If that is necessary, specific directions will be provided.



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Getting Started

Introduction	1-3
Facility Power Requirements	1-3
DC600 LEDs	1-4
DC600 Standard Edition	1-4
DC600 Professional Edition	1-4
Motion Sensor	1-4
DC600 Configurations	1-4

Introduction

The DC600 portal system is a fully assembled turn-key solution that uses Radio Frequency Identification (RFID) for asset identification and tracking goods movement in manufacturing plants, cargo logistics, distribution centers, warehouses, and stores.

The DC600 includes an integrated RFID reader and high-performance antennas for fast, accurate reading of RFID tags. All internal antenna-to-reader connections are included to reduce procurement time and installation effort. The DC600 can leverage two or more antennas for each dock door to increase coverage.

The DC600 can sustain minor non-direct pallet impact. Its bolted installation makes it robust for industrial environments. The DC600 is dust and water resistance to ensure reliable service in harsh environments and can work in temperatures between -4° F to +122° F (-20° C to 50° C) and humidity of 5% to 95% RH.

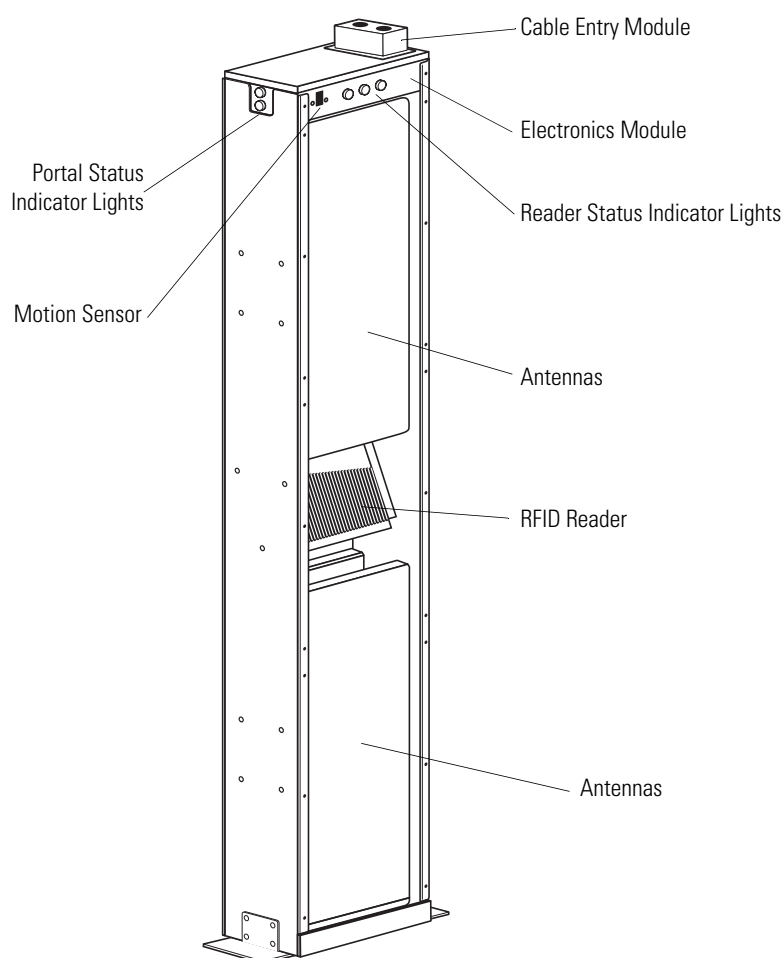


Figure 1-1. DC600 Parts

Facility Power Requirements

The DC600 portal system requires the following power input requirements:

1. A dedicated AC circuit is recommended (but not required), 4.5 amps is the maximum current.
2. AC voltage must be within the 90VAC - 264VAC range.
3. AC power cycle requirements must be within 47Hz to 63Hz.
4. An external power switch that disconnects all poles is recommended. The power switch for the DC600 is located inside of the Cable Entry Module.

DC600 LEDs

The DC600 includes two sets of LEDs described in [Table 1-1](#).

Table 1-1. DC600 LED Indications

LED	Indication
Portal Status LEDs (located on side of DC600, near the top, non-programmable)	
Green	DC600 is powered on.
Red	Hardware fault.
Reader Status LEDs (located on front/rear of DC600, near the top, programmable)	
Red/Green/Amber	All three LEDs light upon power-up.
Amber	Successful tag read.
Green	Reader firmware driven or programmable via XML commands.
Red	Off by default, but programmable via XML commands.

DC600 Standard Edition

The Standard Edition DC600s include the following components:

- **DC600 Dock Door Frame:** The dock door frame provides a bolted installation and houses the XR400 reader and high performance antennas.
- **XR400 RFID Reader:** Refer to the *XR400 Integrator Guide*.
- **High Performance Antennas:** The antennas connect to the reader to enable tag reading in the read range. Dual models include four antennas, and single (left or right) models include two antennas.
- **Portal and reader status LEDs.**

DC600 Professional Edition

The Professional Edition DC600s include all of the components offered in the Standard Edition, as well as the motion sensor.

Motion Sensor

The motion sensor initiates tag reads when movement is it detected. This ensures antennas only read tags when tag movement occurs through the dock door, e.g., when pallets pass through the DC600 system.

DC600 Configurations

The DC600 is available in single (left or right) and dual configurations for monitoring different types of dock doors. Businesses can choose between the Standard or Professional editions depending on requirements.

The DC600 offers three configurations:

- **Single:** Includes two high-performance antennas mounted on a single frame that installs on the side of a dock door. This is usually mounted as a paired system with another single or another dual.
- **Dual:** Includes four high-performance antennas mounted on a single frame that installs between two dock doors. This is usually mounted as a paired system with one or two singles.
- **Slim Single:** Includes two high-performance antennas mounted on a single compact frame that installs against a wall. This is usually mounted as a paired system with another single model or a single and dual model.

See [Figure 1-1 on page 1-3](#) for DC600 model illustrations.

2

Installation

Introduction	2-3
Installation Configurations	2-3
Two Single DC600s	2-3
One Dual with Two Singles	2-4
Multiple Duals with Two Singles	2-4
Two Slim Singles	2-5
Mounting the DC600 to the Floor	2-6
Installing the Floor Guard (Optional)	2-6
Installing Power and Ethernet Cables	2-7
Powering the XR400	2-8

Introduction

This chapter describes how to install the DC600 and accessories. Before beginning the installation refer to the *Facility Power Requirements* on page 1-3 and confirm that the DC600 power requirements have been satisfied. The chapter is divided into 3 sections:

- Installation Configurations
Provides an overview of some of the DC600 installation configurations.
- Mounting the DC600
Provides mounting instructions.
- Connecting Power and Communications
Provides power and communications installation and connection instructions.

Installation Configurations

Install the DC600 in the configuration that best suits requirements and maximizes performance.

Two Single DC600s

This configuration is appropriate for a single dock door, consider two single models.

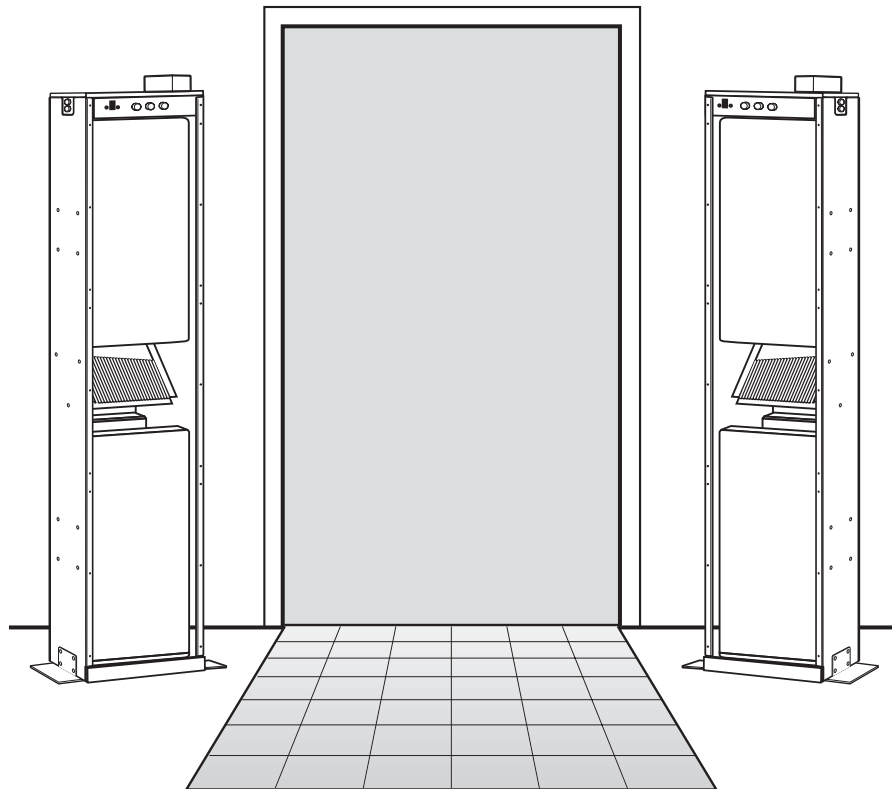


Figure 2-1. Two Singles Configuration

One Dual with Two Singles

This configuration is appropriate for two dock doors positioned next to each other.

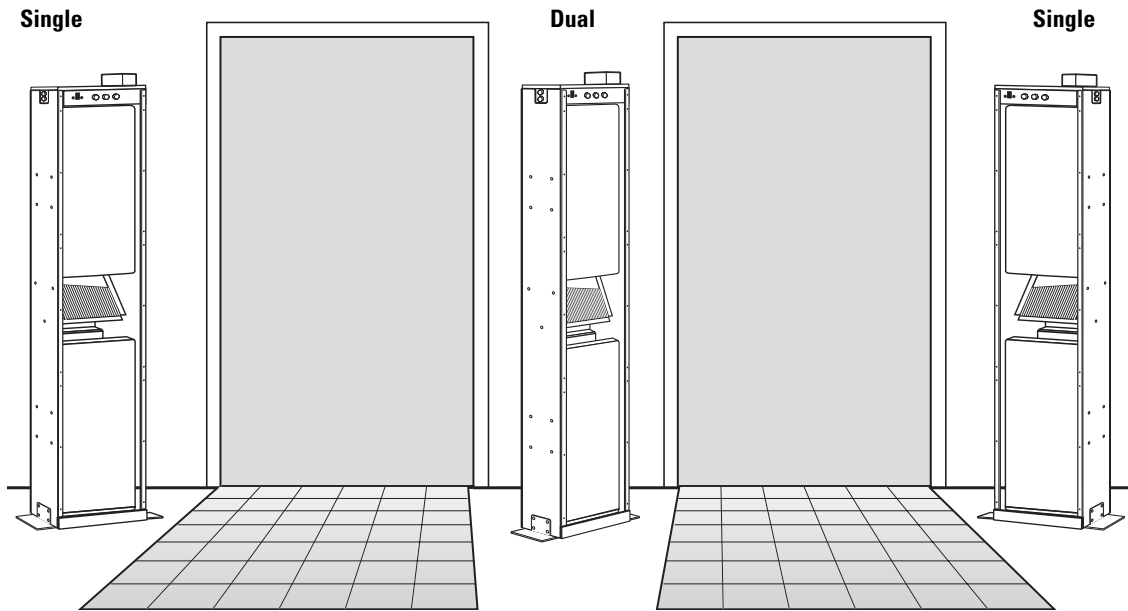


Figure 2-2. One Dual with Two Singles Configuration

Multiple Duals with Two Singles

This configuration is appropriate for multiple dock doors positioned next to each other.

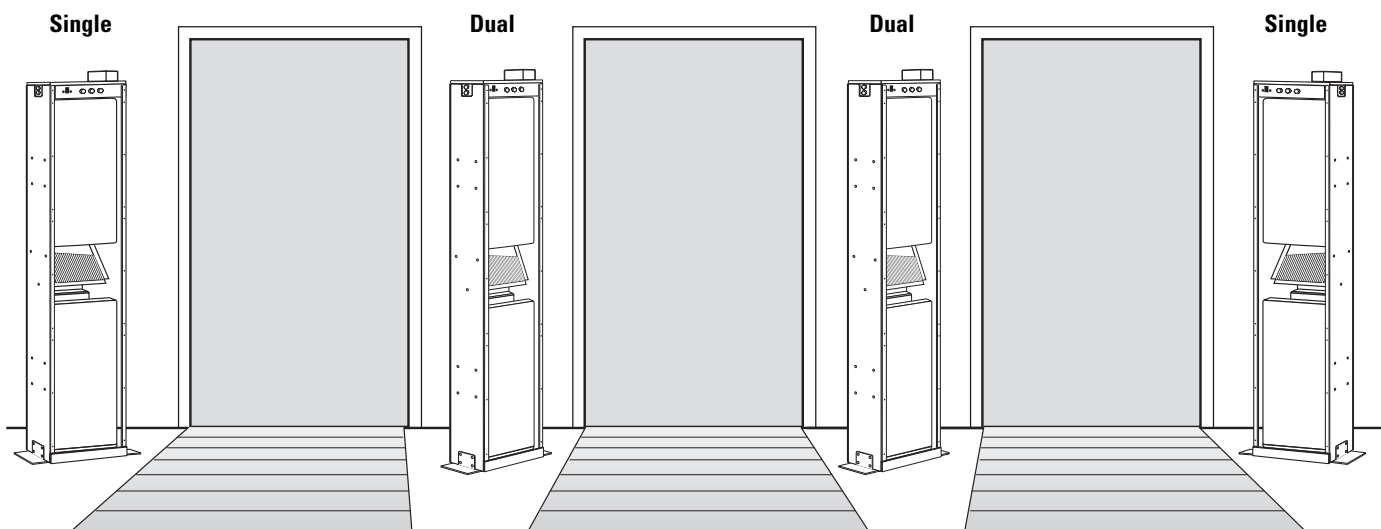


Figure 2-3. Multiple Duals with Two Singles Configuration

Two Slim Singles

This configuration is appropriate for internal doors with limited space.

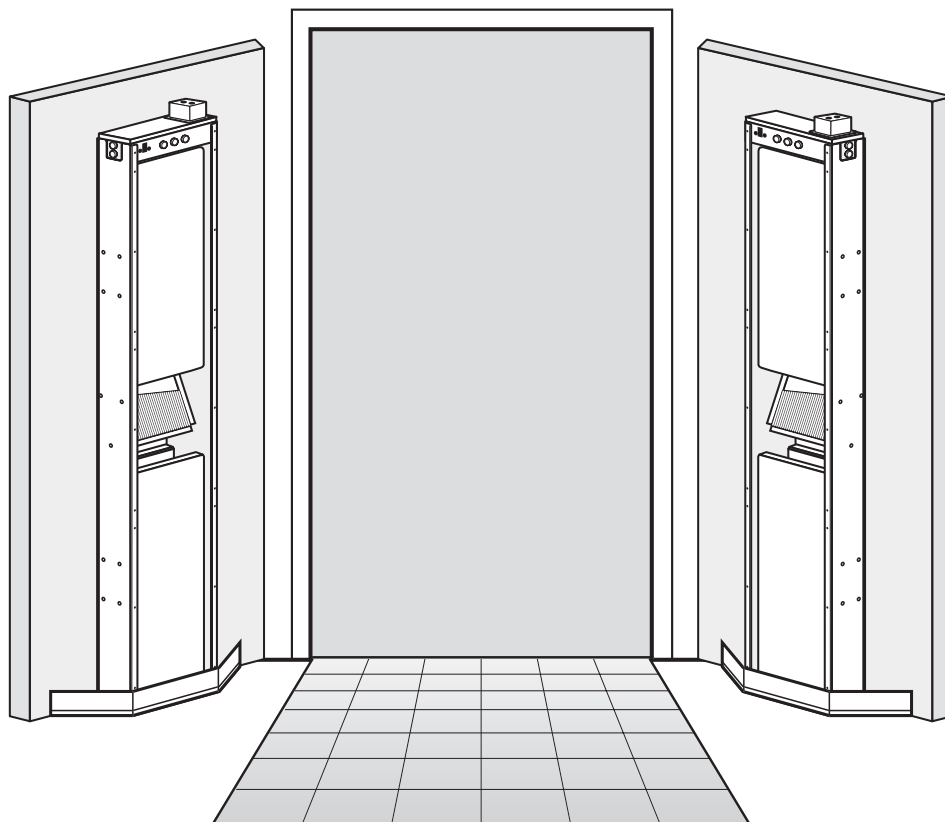


Figure 2-4. Two Slim Singles Configuration

Mounting the DC600 to the Floor

The DC600 includes a base plate with six holes for bolting the DC600 to the floor (four holes for the Slim Single model). After selecting a location for the DC600, drill bolt holes into the floor that align with the holes in the base plate. Insert six (or four for the Slim Single model) 0.5 in. (1.27 cm) diameter ground fastening bolts through the base plate and into the bolt holes to secure the DC600 to the floor. See *Base Plate Mounting Dimensions - Single/Dual Model on page A-4*.

For the Slim Single model, in addition to securing the DC600 to the floor, also use the appropriate wall fasteners to secure the DC600 to the wall.

Installing the Floor Guard (Optional)

The *DC600 Floor Guard QRG*, P/N 72-75043-xx provides printed a full size mounting template (in the box to provide for accurate positioning of the DC600 Floor Guard.

To install the optional floor guard:

1. Refer to *Installation Configurations on page 2-3* for information on DC600 configuration and location options.
2. Position the DC600 Mounting Template under the DC600 and line up the DC600 mounting holes with the mounting holes on the mounting template. The mounting template shows the position of the Floor Guard two right hand mounting holes.
3. Use the mounting template to locate the DC600 Floor Guard directly over the mounting template locating holes.
4. Use the Floor Guard to mark the mounting hole locations on the floor
5. Remove the DC600 Floor Guard and prepare the floor for mounting as applicable for the floor material.
6. Replace the DC600 Floor Guard and attach with fasteners appropriate for the floor material.

To install the floor guard, drill four bolt holes into the concrete floor that align with the four tabs in the floor guard. Insert four standard 0.5 in. (1.27 cm) diameter fastening bolts through the floor guard tabs and into the bolt holes to secure to the floor. See *Base Plate and Floor Guard Mounting Dimensions - Single/Dual Model on page A-5*.

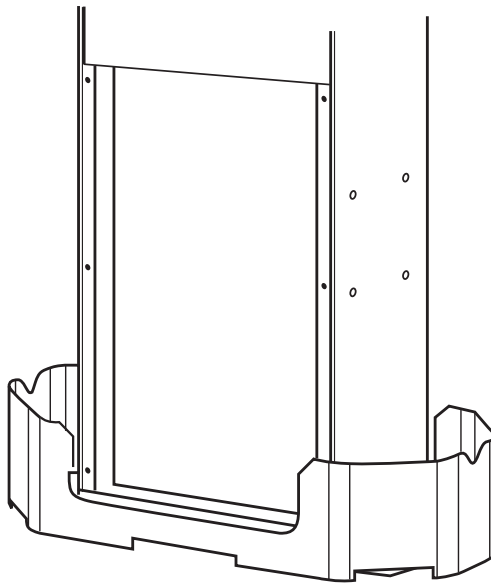


Figure 2-5. Floor Guard

Installing Power and Ethernet Cables

The DC600 electronics module contains input points for power and Ethernet cables. To power the DC600 and connect the Ethernet cable:

1. Remove the four screws that secure the cable entry module to the top of the DC600.

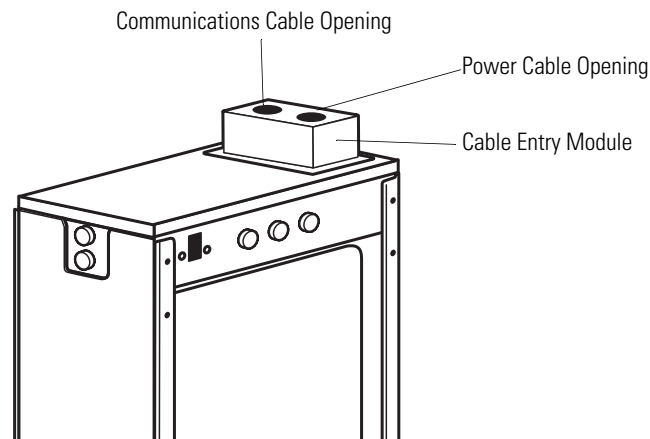


Figure 2-6. Cable Entry Module

2. Remove the cable entry module.
3. Obtain conduit fittings for the two cable openings in the cable entry module, depending on the cable conduits used. Nominal conduit fitting trade size is 0.75 in (1.9 cm) diameter.
4. Insert the Ethernet cable conduit into the communications cable opening in the cable entry module.
5. Route the Ethernet cable from its conduit to the reader. For dual DC600 models, remove one of the top antennas to facilitate routing to the reader.
6. Connect the Ethernet cable to the Ethernet port on the reader.
7. Connect the other end of the Ethernet cable to the host device.
8. Insert the power cable conduit into the power cable opening in the cable entry module.
9. Route the power cable from its conduit to the plug provided.
10. Open the plug and connect the three power cable wires to the terminals inside the plug, then close the plug.
11. Connect the plug to the socket of the IEC 320 module on top of the electronics module.
12. Plug the other end of the power cable into an AC power source.



Note

The DC600 power switch is located on the IEC 320 power entry module. Turn the switch on or off as desired before replacing the cable entry module.

13. Replace the cable entry module by securing with the four screws removed in Step 1.

For pinout and wiring specifications for electronics module components, see *Appendix A, Specifications*.

Powering the XR400

If replacing the XR400 Reader within the DC600 for any reason, shut off power to the DC600 system before disconnecting power from the reader.



Applying power to the XR400 reader before establishing proper grounding can cause a benign spark. Adhere to the following procedures to ensure proper grounding.

To power the reader:

1. Insert the power supply's barrel connector into the XR400's power port.
2. Turn on the power switch on the DC600 Electronics Module. The green Power LED on the XR400 lights to indicate the XR400 is powered on.

To power down the reader:

1. Turn off the power switch on the DC600 Electronics Module. The green Power LED turns off to indicate that the device is powered off and the system is not operational.
2. Remove the barrel connector from the XR400's power port.



Do not power off the XR400 until the yellow LED is off, indicating that reads are not in process.

Motion Sensor Configuration

Introduction	3-3
Antenna Setup and Configuration for Polling with Motion Sensor.....	3-3
Single Model With Two Antennas	3-3
Dual Model.....	3-4

Introduction

This chapter describes how to configure the XR400 to work with the DC600 when using a motion sensor, and how to install the antennas and group them logically using firmware to avoid deployment problems. For details on the Web-based administrator option refer to the *XR400 RFID Reader Integrator Guide*.

Antenna Setup and Configuration for Polling with Motion Sensor

To use the motion sensor with the DC600 enable the *Use Motion Detector* option using the Web-based Administrator Console of the XR400 firmware. Refer to the *XR400 RFID Reader Integrator Guide*.



WARNING

The motion sensor is tied to the antennas that are connected to the side of DC600 where the motion sensor is installed. Therefore the system treats antennas 1 and 2 as a combined pair, and antennas 3 and 4 as a combined pair. Once the antenna ports are combined, the host application can only command the 1st and 3rd port. Any other pairing or reconfiguration results in degraded performance.

Following are recommended antenna configurations when using a motion sensor. Avoid using other configurations.

Single Model With Two Antennas

When using the single model (left / right) with a motion sensor use antenna pairs of either Antennas 1 and 2 or Antennas 3 and 4 (depending on the model used). Ensure the antennas are mounted on the correct side as indicated by the diagram and combined into a group before reading tags.

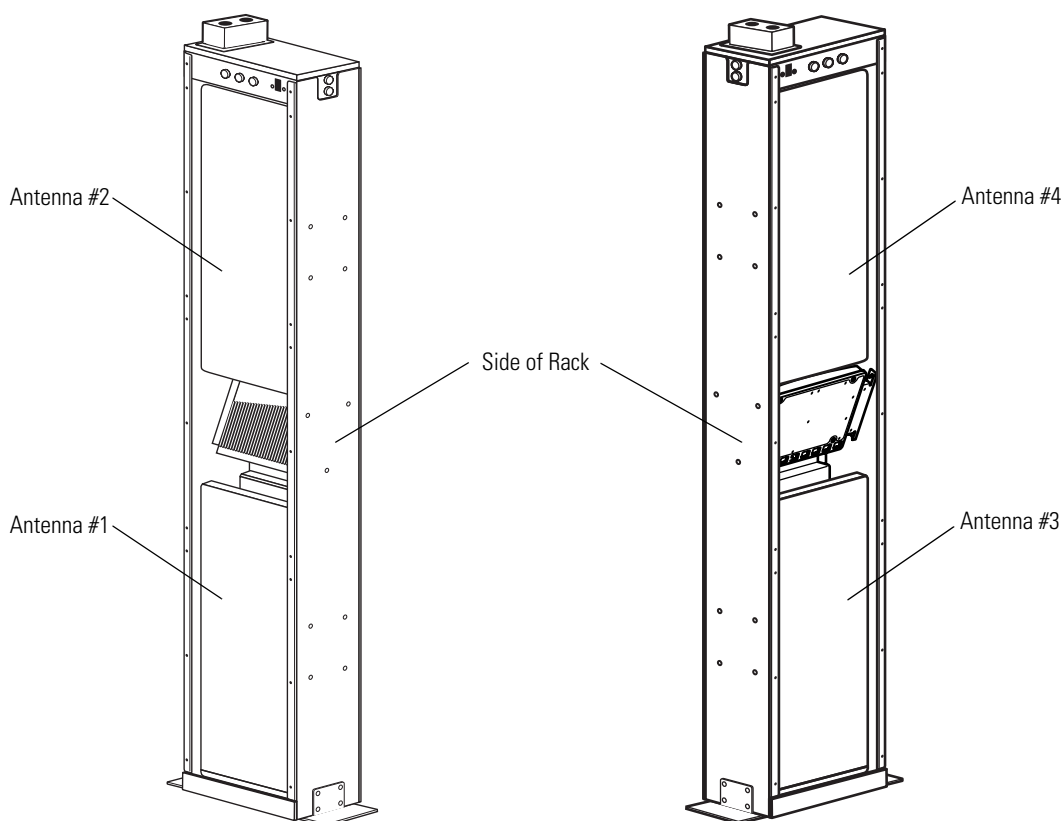


Figure 3-1. Single Model Configuration

Dual Model

When using a dual model with motion sensors and deploying all 4 antennas, ensure antennas 1 and 2 are stacked on the front of the DC600 (the reader faces the front) and combined, and antennas 3 and 4 are stacked on the rear of the DC600 and combined (i.e., Antennas 1 and 2 are group 1, Antennas 3 and 4 are group 2).

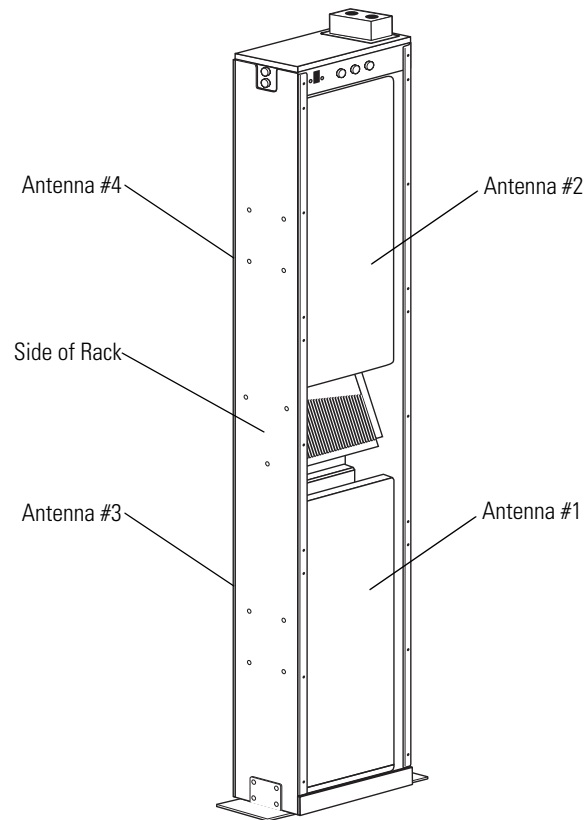


Figure 3-2. Dual Model Configuration

Specifications

Technical Specifications	A-3
DC600 Specifications	A-3
Base Plate Mounting Dimensions - Single/Dual Model	A-4
Base Plate and Floor Guard Mounting Dimensions - Single/Dual Model	A-5
Base Plate Mounting Dimensions - Slim Single Model	A-5
Base Plate and Floor Guard Mounting Dimensions - Slim Single Model	A-6
Sensor and Light PCB Signals and Pinouts	A-7
GPIO Signals	A-9
LED PCB Wiring Diagram	A-10

Technical Specifications

DC600 Specifications

The following table summarizes the DC600 intended operating environment and general technical hardware specifications.

Table A-1. DC600 Technical Specifications

Feature	Description
Physical Specifications	
Dimensions	Single/Dual: 76.78" H x 21.00" W x 7.87" D (195.02 cm H x 53.34 cm W x 19.99 cm D) Slim Single: 75.88" H x 17.25" W x 4.75" D (192.74 cm H x 43.82 cm W x 12.07 cm D)
Base Plate Dimensions	Single/Dual: 21.00" W x 10.87" D (53.34 cm W x 27.61 cm D) Slim Single: 17.25" W x 4.75" D (43.82 cm W x 12.07 cm D)
Weight	Single/Dual: ~ 120 lbs (54.5 kg) Slim Single: ~ 60 lbs (27.2 kg)
Power	Voltage: 100 - 240 VAC Current: 4.5 Amps (maximum) Frequency: 50-60 Hz
Environmental Specifications	
Operational Temperature	-4° to +131° F (-20° to +55° C)
Storage Temperature	-40° to +185° F (-40° to +85° C)
Humidity	5-95% non-condensing

Base Plate Mounting Dimensions - Single/Dual Model

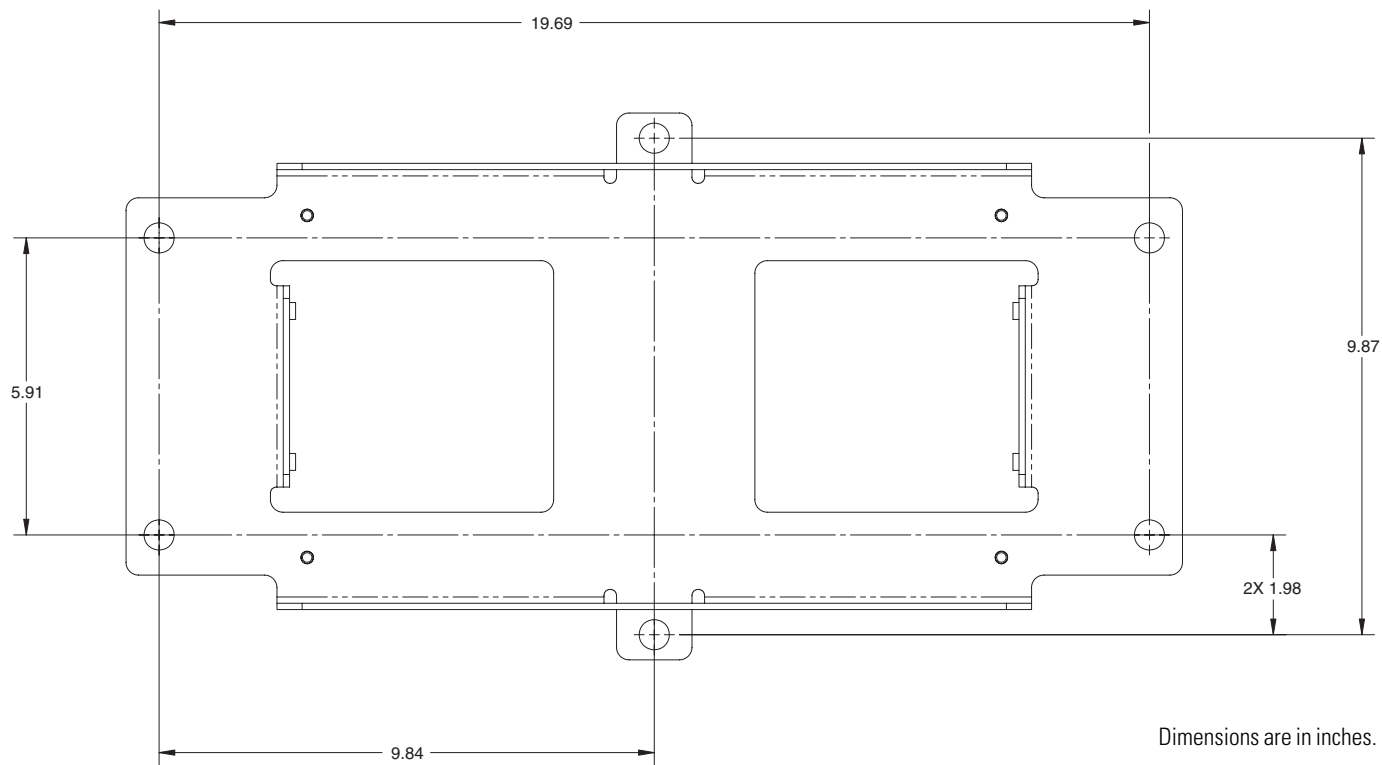


Figure A-1. Base Plate Mounting Pattern - Single/Dual Model

Base Plate and Floor Guard Mounting Dimensions - Single/Dual Model

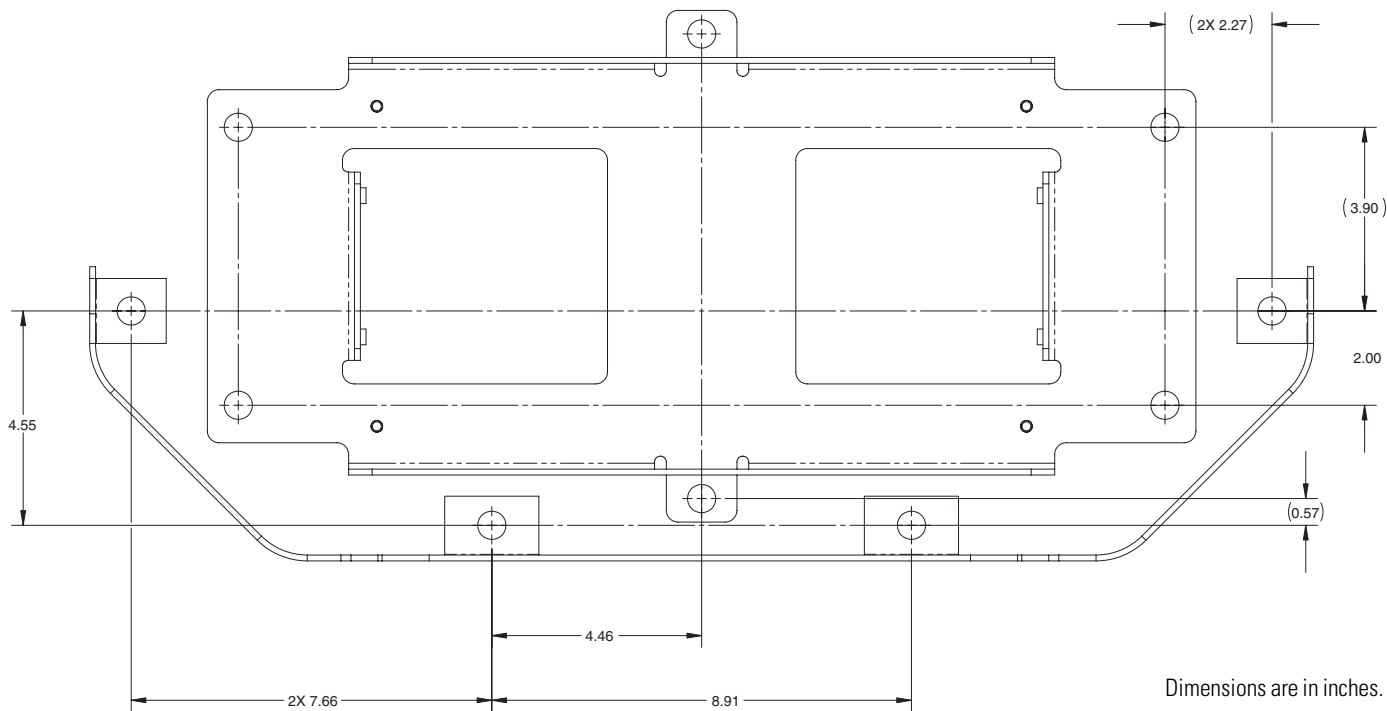


Figure A-2. Base Plate and Floor Guard Mounting Pattern - Single/Dual Model

Base Plate Mounting Dimensions - Slim Single Model

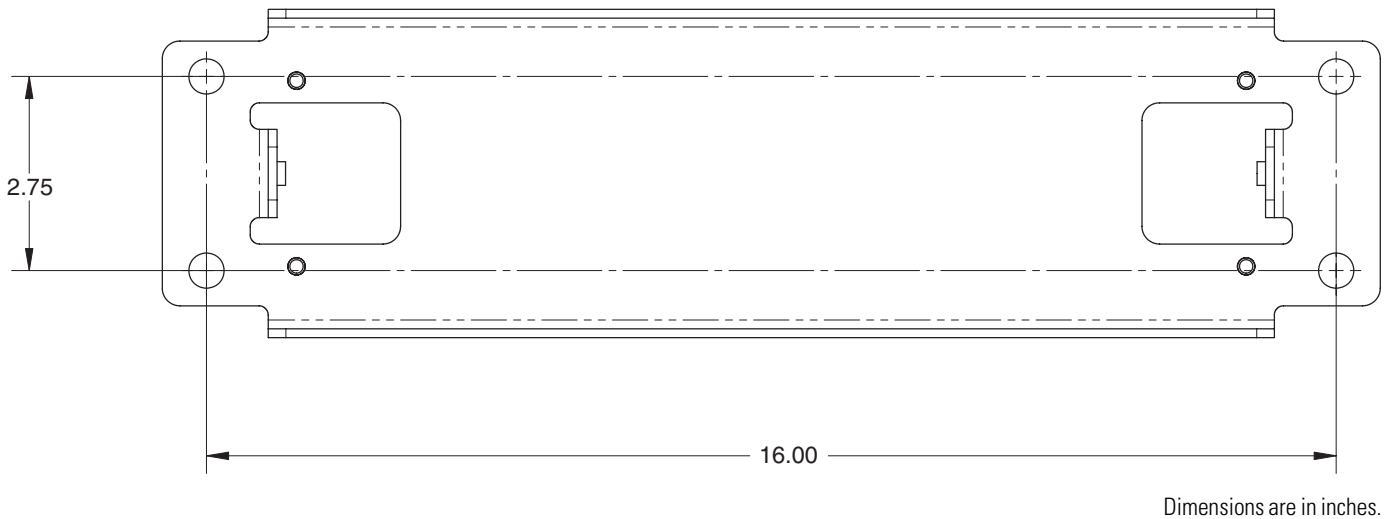


Figure A-3. Base Plate Mounting Pattern - Slim Single Model

Base Plate and Floor Guard Mounting Dimensions - Slim Single Model

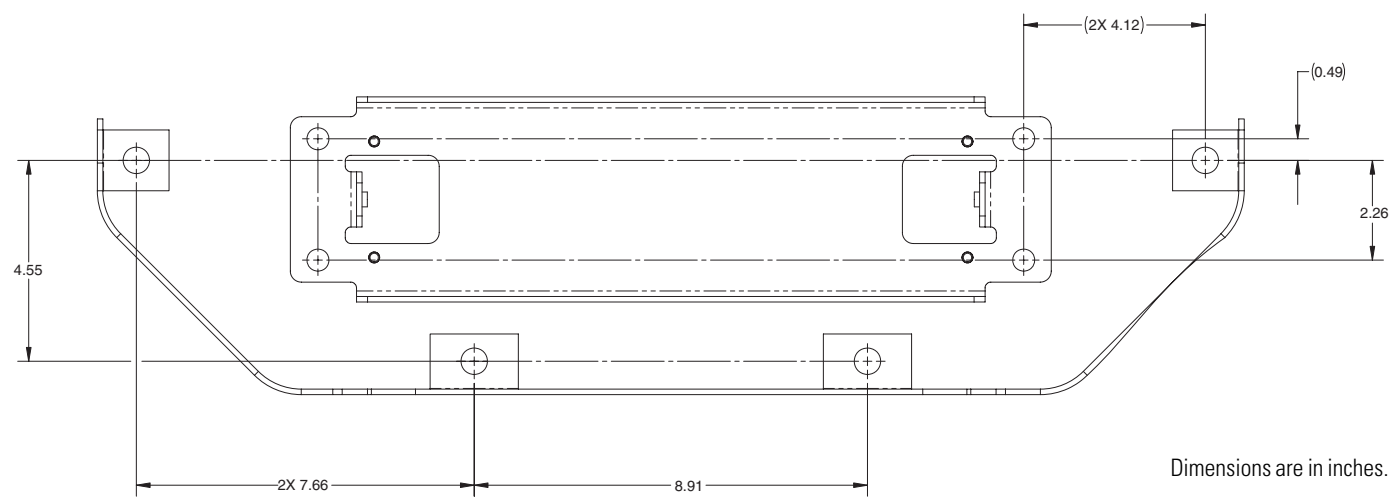


Figure A-4. Base Plate and Floor Guard Mounting Pattern - Slim Single Model

Sensor and Light PCB Signals and Pinouts

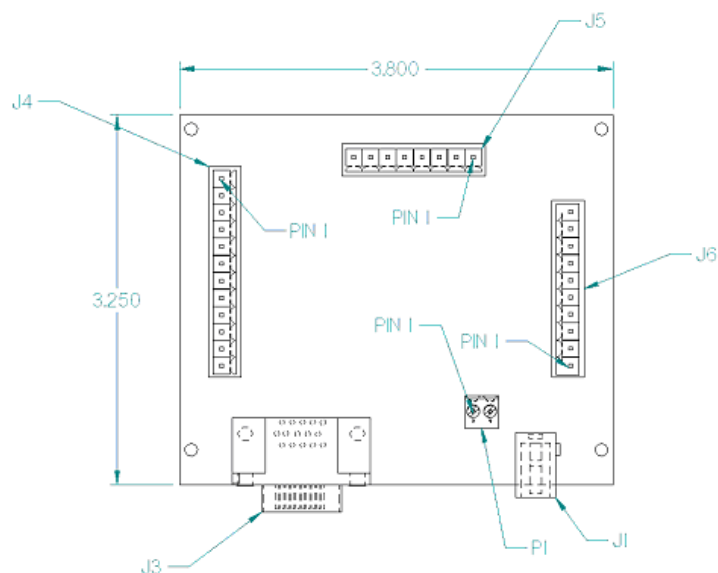


Figure A-5. PCB Diagram

Table A-2. J4 Pinout: 12-Pin Terminal Block Connector

Pin Number	Pin Name	Direction	Description
1	LEFT_MOTION_SENSOR_PWR	-	24 VDC to power left motion sensor
2	LEFT_MOTION_SENSOR_NO	I	Left motion sensor input signal
3	LEFT_MOTION_SENSOR_COM	-	Left motion sensor common
4	RIGHT_MOTION_SENSOR_NO	I	Right motion sensor input signal
5	RIGHT_MOTION_SENSOR_COM	-	Right motion sensor common
6	RIGHT_MOTION_SENSOR_PWR	-	24 VDC to power right motion sensor
7	SPARE_PWR	-	24 VDC spare power
8	SPARE_COM	0	Spare common
9	SPARE_GND	-	Spare ground
10	CHASSIS_GRN	-	Chassis green LED cathode
11	CHASSIS_COM	-	Chassis red and green LED anode
12	CHASSIS_RED	0	Chassis red LED cathode

Table A-3. J5 Pinout: 8-Pin Terminal Block Connector

Pin Number	Pin Name	Direction	Description
1	RIGHT_SENSOR_PWR	-	24 VDC to power right photoelectric sensor
2	RIGHT_SENSOR	I	Right Photoelectric sensor input signal
3	LEFT_SENSOR_PWR	-	24VDC to power left photoelectric sensor
4	LEFT_SENSOR	I	Left photoelectric sensor input signal
5	RIGHT_SENSOR_COM	-	Right sensor common
6	LEFT_SENSOR_COM	-	Left sensor common
7	SENSOR_GND	-	Sensor ground
8	SENSOR_GND	-	Sensor ground

Table A-4. J6 Pinout: 10-Pin Terminal Block Connector

Pin Number	Pin Name	Direction	Description
1	RIGHT_LIGHT_PWR	-	24 VDC to power right light bar
2	RIGHT_RED	O	Right red light control signal
3	RIGHT_YEL	O	Right yellow light control signal
4	RIGHT_GRN	O	Right green light control signal
5	LEFT_LIGHT_PWR	-	24 VDC to power left light bar
6	LEFT_RED	O	Left red light control signal
7	LEFT_YEL	O	Left yellow light control signal
8	LEFT_GRN	O	Left green light control signal
9	LEFT_LIGHT_COM	-	Left light common
10	RIGHT_LIGHT_COM	-	Right light common

GPIO Signals

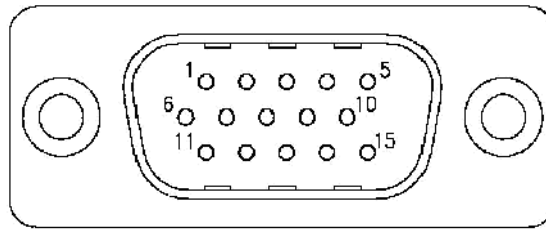


Figure A-6. GPIO Connector

Table A-5. J3 Pinout: External GPIO Connector

Pin Number	Pin Name	Direction	Description
1	GND	-	Ground
2	AX1_LCLK	I	External GPIO Input - Bit 1
3	AX3	I	External GPIO Input - Bit 3
4	AX5	I	External GPIO Input - Bit 5
5	AI1_RIGHT_SENSOR	O	External GPIO Output - Bit 1
6	AI3	O	External GPIO Output - Bit 3
7	AI5	O	External GPIO Output - Bit 5
8	GND	-	Ground
9	AX0_CLK	I	External GPIO Input - Bit 0
10	AX2_DIN	I	External GPIO Input - Bit 2
11	AX4	I	External GPIO Input - Bit 4
12	AI0_LEFT_SENSOR	O	External GPIO Output - Bit 0
13	AI2	O	External GPIO Output - Bit 2
14	AI4	O	External GPIO Output - Bit 4
15	5.0V_GP	I	5.4 V Power

LED PCB Wiring Diagram

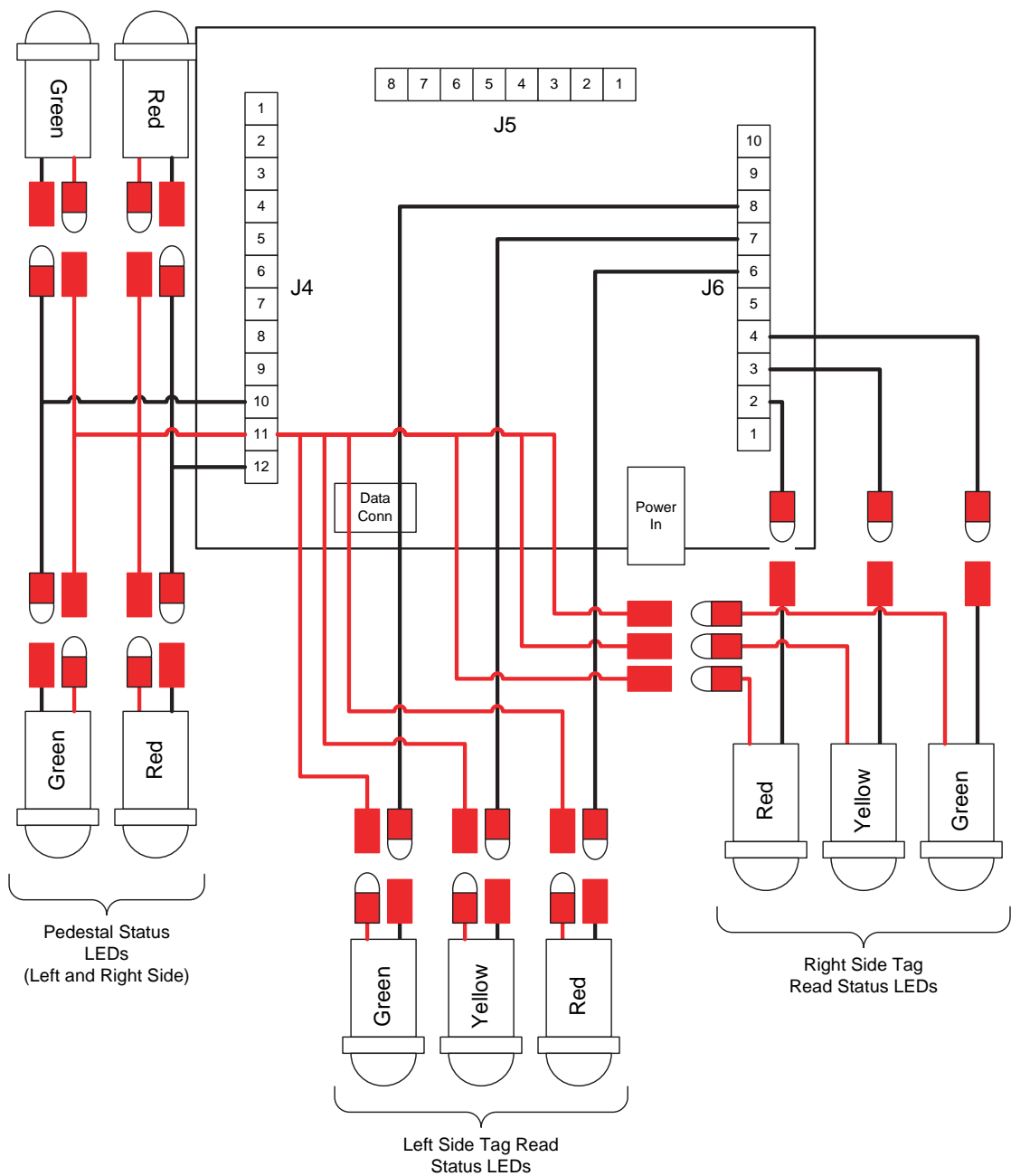


Figure A-7. LED PCB Wiring

XML Software Commands

Reader Status LED Commands.....	B-3
Example 1.....	B-3
Example 2.....	B-3

Reader Status LED Commands

Table B-1 lists the XML commands for controlling the red and green reader status LEDs.

Table B-1. XML Commands for LEDs

Function	Description
rred	Turns on the right red LED
rrto	Sets the time out of the right red LED
rgreen	Turns on the right green LED
rgto	Sets the time out of the right green LED
lred	Turns on the left red LED
lrto	Sets the time out of the left red LED
lgreen	Turns on the left green LED
lgto	Sets the time out of the left green LED

Example 1

The following command turns off the right red LED for a reader with IP address 192.168.127.254:

`http://192.168.127.254/cgi-bin/dataProxy?oper=setLightIndicator&rred=off`

Example 2

The following command turns on the right red LED indefinitely and turns on the left green LED for one second:

`http://192.168.127.254/cgi-bin/dataProxy?oper=setLightIndicator&rred=on&rrto=0&lgreen=on&lgto=10`



The time out parameter is in 100 ms intervals. For example lgto=10 sets the time out to 1000 ms, or 1 second.

Repeat XML commands for each color in the light bar and for each light bar, i.e., left and right.



XML commands only control the red and green LEDs in the light bars.

Index

B

bullets ix

C

cables
 ethernet 2-7
 power 2-7
commands
 reader status LED B-3
configurations 1-4
 dual 1-4
 installation 2-3
 professional edition 1-4
 single 1-4, 3-3
 slim single 1-4
 standard edition 1-4
connection 2-7
 ethernet 2-7
 mounting 2-3
 power 2-7
 powering XR400 2-8
conventions
 notational ix

D

dimensions A-3
dual model 1-4

E

ethernet
 connection 2-7

G

GPIO signals A-9

I

information, service x
installation 2-7
 configurations 2-3
 ethernet 2-7
 motion sensor 3-3
 mounting 2-3
 power 2-7
 powering XR400 2-8

L

LED PCB
 wiring A-10

LEDs

 indications 1-4
 portal status 1-4
 reader status 1-4
 reader status commands B-3

M

motion sensor 1-4
 configuration 3-3

mounting 2-3

O

operating environment A-3

P

parts diagram 1-3

pinouts A-7

 terminal block A-7

power

 connecting 2-7

 connecting XR400 2-8

 specification A-3

S

service information x

signals

 GPIO A-9

single model 1-4

slim single model 1-4

specifications A-3

symbol support center x

T

technical specifications A-3

terminal block pinouts A-7

W

weight A-3

X

XML commands B-3

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